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THE JOURNAL OF PHILOSOPHY
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THE DEFINITION OF LOGIC

OUR familiarity with the definition of logic as a science of the laws of thought makes it easy to forget that thinking is not something given with determinate characteristics like the elementary substances of chemistry. If questioned, we explain that logic is a normative science. Its purpose is to aid in attaining truth and its laws are fixed by their relation to that end. We repeat as fundamental the laws of "identity," "contradiction" and the "excluded middle." On the basis of these and similar laws we develop a technique, more or less perfectly, and consider that our task is completed. To be sure there is still the problem of induction, but Mill's methods, a few selections from the psychology of observation, and perhaps a few general remarks on the definition and methods of science cover that well enough. The conscientious teacher may be a little baffled at the scant power of this method to vitalize thinking. The selected fallacies of the texts may have been adequately conquered, but when he turns to newspaper articles, political speeches, and matters of current interest, which he is sure are rotten with bad thinking, the amount of grist for the logic mill is surprisingly small.

The difficulty seems to me to arise from a blind following of tradition as to the nature of logic. In the first place the process of thinking is not a separate and clearly defined activity of a special faculty. It is a phase of human behavior in response to situations presenting obstacles to direct action. In the second place, its successful culmination, the truth, is for us nothing but the final moment that prepares a course of action fulfilling expectation. Verification demonstrates that it actually does so. Now if we turn to human history, it is not difficult to show that the thought phases of human responses have not always been selected by the same principles and that the expectations that the culmination must lead to fulfilment, if it is to be valued as truth, are not always the same. In other words, if truth is a name for the desideratum of thinking, it has had many meanings and for each meaning there is a different method of thinking that can be called the best. In a generalized sense, the laws of logic are the generalized description of procedures that have been

believed (proved?) to be successful in attaining a desired outcome of thought and that desired outcome is called the truth.

Among primitive peoples there seems to be retained a survival of a way of thinking in which interpretation in harmony with tradition is accepted as truth. In this stage men are impervious to experience. That is, the failure of events to conform to statements does not make them reject the statements but rather add more statements that attempt to link the exceptional cases with tradition and leave the former ones unmodified. Lévy-Bruhl[1] quotes a statement from Livingstone to the effect that after long discussions with rain-makers in Africa he never succeeded in convincing any of them of the falsity of their thinking. Another quotation reveals clearly the thought processes that are used: "On returning from the king's house I shot at a bird on a tree and missed it. I had taken quinine and my hand trembled. But the negroes who were there cried out that it was a bird-fetich and that I *could* not hit it. I shot again and missed again. Triumph of the spectators. However I loaded my gun again. I aimed with care and I hit the bird. A moment disconcerted, the negroes explained that I am a white man and that the laws of fetiches are not wholly true for me. So that my last shot proved nothing to them in the end." It is clear here that the aim of thinking is traditional interpretation and the enforcement of custom, for a native would not have tried to shoot the bird. Naturally with this conception of truth, experiment would not disprove the statement. The only disproof could come from rejecting the custom as bad and changing the habits of practises.

Lévy-Bruhl demonstrates conclusively, I believe, the complete difference between the type of primitive thinking and ours, although I think he hardly grasps its full extent. Our thought and observation are so thoroughly controlled in general by the ideas of the subject and objective, of the uniformity of nature,[2] and of universal causation that it makes us almost incapable of understanding thinking where these ideas are not sovereign. Yet it is not unusual to find violations of the principles of identity, contradiction and the excluded middle at the primitive stage. The one law Lévy-Bruhl lays down is that of "participation," but he calls the whole process "pre-logical." It is more expedient, however, to recognize it as a different type of logic controlled by a different aim. Also it has not been wholly superseded as any student of *Science and Health* or other contemporary mystical publication can testify.

[1] *Les functions mentales dans les races inférieures,* p. 62.

[2] Poincaré believes this derived from watching the stars and Cornford tries to show that it was, for the Greeks, a carrying over of habit and custom from social practises.

Unfortunately we can not trace the historic continuity of our thinking, in any adequate fashion, to early types parallel to those we now study in the lower races. The pre-philosophic stages of Greek thought suggest, however, something not far different. At the beginnings of Greek philosophy the integration of experiences into ideas having close resemblance to those dominating our thought processes is well under way. But it is probable that we exaggerate the resemblance. It would be interesting to know how Plato would react to the expositions of his thought current in the modern philosophy classroom. We attempt to define Greek scientific aims and assert that Greek scientists sought the permanent behind the changing facts of perception, but there is no adequate articulation of the method by which this is attained. Plato escapes the problem by the doctrine of reminiscence helped out by suggestions from perception and the Socratic comparison of particular instances. Aristotle's epagogic is little more than the process of taking away specializing differences and moving by formal analysis to the most universal. The outcome intended is the interpretation of factual experience through an unified system of ideas in a form suited primarily to esthetic contemplation. The modern idea of increasing man's mastery over his destiny is not yet born.

The result of Greek thinking was the emergence of so many ideas that have been incorporated in contemporary thought processes that it is easy to forget the vast differences implicit in their type of thinking. They should be manifest from the nature of Aristotelian logic, but the intensity of our gratitude to Greece and the still prevalent yearning for authority has led us to try to repeat the old logical forms and believe that they must be expressing something vital in our thinking. We bravely set forth examples of syllogisms and fallacies, but we must recognize that our conclusions are rarely attained by such forms. The real problem that generates Aristotelian logic is the problem of disclosing a relation between the particular and the universal. For this purpose rigid definitions, formal propositions, and syllogisms are pertinent. This problem is still with us when the results of our thinking must be displayed, but it has now become a problem of exposition rather than of discovery. Hence the method which Aristotle conceived as that of thinking, a method of logic, is now a method of rhetoric.

Medieval thinking faces a problem somewhat analagous to that of the Greek and readily accepts the Aristotelian system. There is a difference, however, and that difference introduces changes into the logic. The purpose is still fundamentally contemplative, but instead of an unified system of ideas derived from experience, the outline, or

norm, of the system is derived from orthodox texts. The Socratic method and the epagogic are minimized. Revelation takes the place of reminiscence. The metaphysical aspect of the relation of the universal and the particular is emphasized, but formally it is the linkage of statement with statement that is sought. Hence that appearance of artificial schematization that so many writers on logic have since condemned as a debasing of the Aristotelian procedure. It is not really this, but a modification consequent upon the change in the conception of the function thinking is expected to fulfil. This function may seem to us less significant but the method can only be judged from its adequacy to the desired result and, so judged, it is no less efficient than the earlier one. Both Greek and scholastic aims still sometimes motivate contemporary thinkers and for them at such moments these logics are still good.

Roger Bacon leads those who proclaim a new motive for thinking. If his proposed inventions are to be realized, thinking must become something quite different from the processes his contemporaries professed to esteem. It was the merit of Francis Bacon to set forth the claim of experience, and if his method of induction failed, it is perhaps because in his haste for utility, he was caught by the dogma of the universal equality of minds. He had still to learn that minds have a history and that their efficiency depends both upon native endowment and the cumulation of experiences, that they are not extra-physical complete instruments, but must extend themselves into all sorts of laboratory apparatus which thus become integral parts of the process of thought.

Since Bacon, logicians have contented themselves with varied attempts to juxtapose induction and deduction in a single system. The rapid lapse of modern philosophy into German scholasticism in the service of a new orthodoxy, and the authority of that philosophy, did much to retard the development of the new conceptions of thought. But outside of philosophy scientific work progressed and the phrase "methods of science" has become increasingly popular. John Stuart Mill, because he was skilful in depicting the differences between the actual procedure of sciences and the methods of traditional logic, was the unconscious instrument by which many have come to see that the fulfilment of the aims of modern thinking can not easily be defined significantly through generalized method. If prediction and control are the ends of thinking, thought becomes a function of the subject matter to such an extent that it can not be isolated with profit to logic. If there is to be a modern logic it must be primarily a logic of investigation. Beginning with the picture of the new attitude of mind implied by the thirst for the results of ap-

plied science, its laws must be articulated from the concrete procedures of scientists, inventors and social innovators. But apart from the subject matter with respect to which they arise, these laws can hardly be understood or applied.

Such a logic is the instrumentalist logic. It has not yet found its way into logic texts in any adequate form and perhaps can never do so. If we neglect the emasculated scholasticism, pieced out by somewhat obvious comments on induction, current to-day, its chief rival is the neo-realistic logic. This system has at least the merit of seeking scientific exactitude and completeness in the modern sense. It is not, however, a method of thinking although it is an instrument that a thinker can use. It can only be called logic if the term is to take on an entirely new connotation. There is, of course, no inherent difficulty in so transforming a term, but whether it would be expedient to do so in this case depends upon the extent to which the new procedure is applicable to scientific procedure. There is a strong historic presupposition that logic must somehow be an interpretation of the best, that is, of scientific knowledge. It must make for the attainment of truth in whatever way truth is defined. A mechanics of rearrangement such as Jevons's "logic" machine or the modern computing machines can hardly be said to exhibit logical processes unless we are prepared to call steam engines and automobiles that run examples of logical processes, a perfectly possible thing but hardly clarifying.

The presupposition of realistic logic is the reduction of experience to terms and relations. Leibniz saw more clearly than the modern partisans that the first necessity is that of a new dictionary in which every object can be so precisely defined that for a system of relation it can be forgotten and a devitalized algebraic letter substituted for it. Whereas he was limited to relations of inclusion and exclusion, modern research has substituted a more rich and flexible system of types of relations, the asymmetrical, transitive, the diadic, triadic and the like. When these relations are few in number a small group of postulates may suffice to define fundamental connections. The method then consists in devices for making manifest the relations that are also present according to the postulates when any two or more entities or groups of entities are given. Such expansions may actually fall within the class of discoveries for it is not always obvious what is really given with the fundamental assumptions. Professor Royce used to be fond of reminding his classes that it took two thousand years to show that when you had given the ideas of the square and of the circle, it was also established that a square could not be constructed by ruler and compass methods having an area

equal to that of a given circle. But is such a discovery quite the equivalent of the discoveries of the properties of radium or of the conditions under which communistic undertakings will be successful? This I doubt, although the connections between the fundamental factors and the conclusion might be exposited by an analogous system.

It is a curious thing that this conception of logic should have come into vogue and attained a high development after the doctrine of evolution had taken such a firm hold on scientific thinking. As Professor Dewey points out in his essay on "The Influence of Darwinism," it is precisely that notion of fixed kinds and abiding essences which lies behind the conception of terms for this logic, that is destroyed by the theory of evolution. The modern scientific problem of definition is that of selecting recurring and identifiable objects with properties that make verifiable predictions possible. The predicting gives little trouble, but not so the discovery of significant properties, or, sometimes, the process of verification. This logical method, though it theoretically should aid the process of prediction, is practically rarely applicable until the problem is solved.

The realistic logicians are fond of asserting that mathematics is nothing but a branch of formal logic. It would be, perhaps, truer to assert that their logic is nothing but an extension of mathematics. They have made clear for the first time the explanation of the possibility of applied mathematics and the use of diagrams in all sorts of fields. This is through the conception of types of relations. If mathematics deals with mere symbolized terms and sets of relational types, naturally whatever is true of these types is true of concretely specified relations that fall under the types, and one set of specifications, such as spacial relations, can serve to represent another, such as movement of prices. Historically mathematics attained its generalizations from the study of what could be counted or measured. It has extended this field to include relations of spacial objects involving other relations sometimes called qualitative. But the new system gives for the first time the generalized method that indicates the course and procedure of all further expansion. The question of the application of realistic logic is then the question of the limitations of applied mathematics.

The mathematical method represents an ideal (*i. e.*, utopian) structure for scientific knowledge. In so far as any investigated field can be reduced to a system of clearly defined entities, not too great in number, and fundamental relations between them abstractly formulated, mathematical derivation of all implied consequences is possible. If there were a few hundred variables and a corresponding number of relations, the technique would become too complicated to

be practicable. The definitions must give an exhaustive list of the properties of the entities in so far as they enter into effective relations within the system in question. With problems of physics and engineering these demands have been sufficiently met. By the use of statistical methods and probabilities, it is possible to make some allowance for factors not observed or the operation of which is not completely understood and the useful application of mathematics extended. Unfortunately in the biological and social sciences, it is not always easy to tell what are fundamental entities or what are their effective properties for situations that are to be met. Hence the application of mathematics makes little progress.

The structure of the physical world parallels the structure of mathematical systems but with some significant differences. In geometry, points are comparatively simple entities. In proper relational systems they are approximately equivalent to lines, although lines have a new quality, direction; lines define plane figures, with a few new properties such as shape and area; planes define solids; *etc.* So in the physical world, from comparatively simple electrons are constituted about 80 different atoms representing different numbers and arrangements of electrons. From these atoms are constituted numberless molecules; from these, aggregated states of matter; from these, probably, protobion, and so on through the cell, organism and multiorganism. In each case, as in geometry, the new entity is constructed from those that are simpler, but as a result of their integration in it new properties appear. There are, however, three striking differences when we compare this system with the mathematical one. In the first place, the number of new properties that appear at each level of integration in the system of nature is vastly greater than in the mathematical system. Hence the number of new definitions required at each step is greatly increased. A single property, direction, gives the new quality of any line, but several new properties would be required to give the new qualities of any atom, affinity, valency, mass, *etc.* In the second place, the first entities of the mathematical system are so highly abstract that all integrations of them permitted by the original postulates are equally possible, whereas in nature the frequency and conditions of occurrence are controlled, atoms of all possible sorts are not generated arbitrarily or in equal numbers. Thirdly, in mathematics we are fundamentally interested in the relations of entities on the different levels, while in nature we are interested especially in the processes whereby integration takes place.

The above strictures on the field of applied mathematics are not meant in any way to detract from its importance. Nothing could be more absurd than to try to belittle a technique by which mankind has

achieved such important and beneficial results both in practical and theoretical matters. They are, however, of significance when it is a question of judging the pretensions of a mathematical system to set itself in the place of logic. Unless this term is to be used in a wholly arbitrary sense, it should denote either the procedure of science or the methods of thinking by which truth, in some specified sense, is obtained. The mathematical system is only one of many instruments in the hands of the scientist and partakes more of the nature of a mechanical process than of concrete thinking. Mechanical thinking may be a moment in the thought process under favorable conditions, but it is far from being the equivalent of that process in general.

The most difficult problem for thinking to-day is that of making an analysis that shall result in the identification and selection of those factors in a given situation that can be taken as an equivalent of it for the purposes of prediction and control. We can not be sure that such factors have been obtained until we have verifications. But only then can they be genuinely symbolized as mathematical entities. Our texts still teach that we first formulate them hypothetically, deduce consequences by a sort of mathematical logic, and then seek verifications. Examples can be adduced, but they are usually taken from the field of applied mathematics. Professor Dewey incorporates this suggestion in the analysis of examples of thinking in his very suggestive little book, *How We Think*, but in actually analyzing the examples, this moment of thinking does not stand out very clearly. What seems to happen is that the idea of the problem and the previously acquired information that is pertinent to its solution are juxtaposed mentally until there results a sort of integration into a new idea all ready to use. Such integrations are accepted and lived by until we find ourselves again in difficulties and then new integrations are needed. Verifications are exhibitions of the potency of the new idea and although the connection between antecedents and consequences in such cases can be exposited deductively, the plan of verification is more likely to arise non-deductively during the psychological process of integration.

With our present preference for the instrumentalist conception of truth, in practise, if not always in theory, it seems unwise to limit logic either to the analysis of certain mental processes or to the objective techniques of the sciences. Perhaps it is too early to forecast what form this logic will take, what principles it will find it expedient to articulate. We need both psychological studies of investigators and empirical studies of investigations. There are some indications that the conception of mental integrations will baffle attempts to formulate the thinking process in a way significant for method

except in so far as precautions concerning observation, memory, and the effects of predisposition and prejudice may be stated. It is equally probable that significant generalizations of scientific practise may fail because of too close association between the materials and the ways of handling them, except in so far as certain systems of classification and arrangement of materials are evident. And there remains the rhetorical problem of the exposition of the results of thinking which can still be served by the survivals of Aristotelian formulæ, although the formal fallacies must be conceived rather as mistakes in reference to materials cited than as errors in deduction. Thus undistributed terms usually indicate a genuine opinion that the whole of a class is involved in a relation, an error in fact and not in inference.

No final definition of logic can then be laid down. In the last analysis logic appears as a method for the attainment of ideas approved for some reason as true. But the grounds for approval can change and with them the conception of the means of attaining the end. Primitive, Greek, and Scholastic aims still obtain amongst us and the most that can be said is that our age most generally prizes the instrumental conception of ideas. Consequently the instrumentalist conception of logic is most pertinent to it. This logic is most at home in the region of applied science. It is naturally disquieting to the ultra-conservative, distasteful to the ethic temperament, and resisted by orthodox theologians, although in each case it may be bent toward the end. Mankind is now seeking consciously directed development, but if it ever again seeks stability, who can say what logic will then prevail? Logic, like all other philosophic desciplines, has its inception in social conditions and its justification in the fulfilment of needs. Its systems, like other systems within philosophy, are not discarded because they have been found to be false, but because they have become uninteresting when new social conditions have brought to the front needs they are unfitted to meet. Errors can undergo correction, but there is no antidote to loss of interest, although the inertia of habit may temporarily maintain both philosophies and social institutions beyond their day.

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PURPOSE

WHEN two dice are thrown on a table, we say that there are eleven chances out of thirty-six that at least one four will be thrown. There is a branch of mathematics given over to the calculation of this sort of chance or probability. But chance in another

sense means "the combination of several systems of causes which are developed each in its own series independently of the others."[1] "For instance, if in the game of rouge-et-noir, I bet that the black will win, and it wins accordingly, it is clear that my desire and my word could not have had any influence on the winning of one color or the other, and likewise that the arrangement of the cards, which I did not know, could not have had any influence on the choice I have made. In this case, two series of facts, absolutely independent of each other, have happened to coincide with each other, and to harmonize, without any mutual influence. This kind of coincidence is what is called *chance.*"[2] Harmony does at times, we recognize, come about in this fashion by chance. But when we find a great number of similar cases in which two phenomena are in harmony with one another, we refuse to believe that the series of events leading to the one phenomenon is independent of the series of events leading to the other. On the contrary, we believe that if we follow back the series of events leading to the one phenomenon we shall come to a point where there is some communication with the series of events leading to the other. Now we do find repeated and persistent cases of harmony between the organism and its environment. In such a case it can not be that the organism and its environment have developed in independence of one another. Rather, in the previous history of both organism and environment, there must be some point at which the environment has influenced the development of the organism, or at which the organism has influenced the environment, or at which each has influenced the other. Communication between the two causal series there must have been. The question is: where and in what form has the communication taken place?

Since Darwin's time men in answering this question have often had recourse to the theory of natural selection. The environment, it is said, has influenced the development of the organism by causing those individuals to survive who are most in harmony with it.[3] But there are some phenomena of which this theory, thus stated, is not a sufficient explanation. The admirable fitness of the human eye has been pointed out by Bergson, Von Hartmann, and others. This complex organ, valuable in the struggle for existence only when completely formed, can not have originated by the natural selection of one part after another. For the organism equipped with but one of the elements that make up the eye would have had no advantage over his fellows and would, on this theory, have had no reason to survive

[1] Cournot, quoted in Janet, *Final Causes,* translation of the second edition by Affleck, p. 19, note.

[2] Janet, *Final Causes,* translation by Affleck, p. 18.

[3] Warren, *A Study of Purpose,* this JOURNAL, Vol. 13, p. 40.

them. On the other hand, it seems quite impossible that the complex eye, completely formed, could have occurred as a chance variation. It is so well adapted to its environment that we can not believe that its development has neither influenced nor been influenced by that environment. Either some theory other than that of natural selection must be called in to explain such an organ, or the eye has not developed in either of the ways that have been considered.

Similarly no completely satisfactory explanation has been given of the way in which purposive actions achieve their objects. I desire to eat an apple and then appropriately stretch out my hand and bring it to my mouth. Professor Warren in a recent number of this JOURNAL argues that such an effect does not follow until the proper association has been set up.[4] But, we may ask, how does it happen that the proper association is ever set up? Surely I do not first make the appropriate reaction entirely by chance. It is not credible that I should come to stretch my hand and that the apple should come to be where it is without there having been some causal connection between me and the apple. Perhaps I succeed by the method of trial and error. But though in the course of my experimenting I make many useless reactions and happen upon the proper one, my reactions, even the useless ones, are not made independently of the apple. There is a causal relation between me and the apple that results in my making reactions of a certain type. Indeed the structure of some organisms is such that this causal relation leads them to make reactions that fall within a very, very narrow range and to make such reactions persistently until the proper one is hit upon. It is just by chance that the organism at a given trial makes the proper reaction instead of one slightly different. For the previous causal relation between it and its object is the same whether it make the proper reaction or a slightly different one. Nevertheless it is not by chance that this organism is reacting towards its object and is not falling asleep. There is a causal relation between it and its object that accounts for the type of reaction it is making, if it does not fully account for the one successful reaction that it finally makes. So too when I cry "four" and the die that has been thrown falls with a four uppermost, it is by chance that I have cried "four" instead of "six." There is no previous causal relation between me and the die that explains why I have called just the number that has turned up. But there is a previous causal relation between me and the die that has resulted in my calling one of the numbers from one to six instead of calling "chair." When an organism experiments by the method of trial and error, consequently, there must have been a previous causal relation between it and its object to account for the type of

[4] *Ibid.*, pp. 17, 18.

reaction it is making. Neither the concept of "chance" nor that of "trial and error" is a satisfactory explanation of the harmony between the object and the type of response the organism makes.

So far, then, there has in certain cases been a failure to segregate and describe that causal relation between organism and environment that has led on the one hand to an organism fitted for its environment and on the other hand to an environment fitted for the organism. In view of this failure, the concept of teleology has been brought forward as a satisfactory explanation. But what is the explanation offered by teleology? According to the doctrine of final causes there is a prevision of the harmonious situation to be arrived at that leads to the organism becoming the thing that it is, namely, a thing adapted to its environment. If we follow back the train of events leading to the organism as we know it, we shall come, it is said, to a point at which there is a desire to bring about the harmonious situation that finally results. Let us however not lose sight of our problem. The harmony between the organism and the environment forces us to believe that there is some communication between the series of events leading to the organism and the series of events leading to the environment. A conscious or unconscious purpose placed in or behind the series of events leading to the organism is not in itself such a connecting link. We require further to be shown how this purpose affects or is affected by the series of events leading to the environment. In short, the problem of describing the method in which the two series are linked together is still on our hands. It really makes no difference whether or not the series of events leading to the organism is causally determined. An indeterminism in the one series does not destroy our belief that there must be a connection between the two series to account for the harmony that results. For this harmony we seek a cause; and this cause can not lie in the one series, but must be a link between the two.

Consequently the theory that there is purpose at some point in the series of events leading to the organism offers us no help in our search for a connecting link. It neither challenges our belief that there must be such a link nor suggests to us what this link may be. The relevant argument for teleology, in fact, concerns only the one series, namely, the series of phenomena leading to the organism adapted to its environment. It leaves to one side the question as to what may be the connecting link that is an efficient cause of the harmony between the organism and the environment. For on the one hand, whether purpose exists or not, there must be a connection between the series of organic phenomena and the series of events in the environment. And on the other hand, until the nature of this link is known, no argument can be drawn from the fact that it exists

to prove either that there is or is not such a thing as purpose in the series of organic changes. Nor when we restrict ourselves to the one series of events, namely, that resulting in the adapted organism, do we find any necessary connection between questions of causality and the question whether purpose exists. We are here dealing only with the history of the organism. The question that arises with respect to causality is not the question how the organism comes to be adapted to its environment, for the cause of such an adaptation must be sought in a connecting link between the two. The question that arises here is whether one state in the life of an organism is determined by what has preceded and how. Now there is no necessary connection, I say, between this question and the question whether purpose exists. For though organic phenomena should be unpredictable, it does not follow that there is a purpose guiding the organism in its career. If organic phenomena are not subject to laws of causality, then we ought not seek an efficient cause of that which we find. Purpose, though it exists, can not have been an efficient cause, and so can not satisfy us in our vain search for such a cause. If, on the other hand, organic phenomena do point back to previous events in the history of the organism, with which events they are causally connected, then these previous events furnish the cause that we seek whether there be a purpose associated with them or not. The concept of purpose, in short, neither aids us in our search for a causal explanation of the harmony between organism and environment, nor hinders us in our search for causal relations between successive phenomena in the life of the organism. Purpose, then, is independent of cause, independent of it in the sense that arguments for teleology can be based upon conflicting theses as to the causal relations that obtain.

It is, in truth, upon analogy or upon a definition of purpose that the argument for design must be based. "It must be confessed," says Janet, "that if experience had not given us beforehand somewhere the type of the final cause, to all appearance we never could have invented this notion."[5] We first attend to one series of phenomena, namely, the series that issues in my own actions. We find at a previous point in this series, or associated with it, a consciousness of the aim to be attained. We then attend to other series of phenomena, to the growth and reactions of organisms in general. And we conclude that since these series are so similar to the series we first investigated, there must likewise be a purpose in or associated with them. The argument for design, it is evident, can not get started unless there is admitted to be purpose in the series of events leading to my own actions. If it is denied that there is consciousness in

[5] Janet, *Final Causes*, tr. by Affleck, p. 92.

or associated with this first series, then it can not be proved there is consciousness in or associated with any other series, no matter how similar. If, however, so much is admitted in the series of events leading to my own actions as a purpose objectively defined, then perhaps the thesis can be rendered plausible that there is the same sort of purpose in other series of organic phenomena. The same result can, of course, be obtained without recourse to analogy. For if purpose be defined in terms of the characteristics my actions and other organic phenomena have in common, the purposiveness of these phenomena follows directly from the definition. Now what is the similarity between me and other organic phenomena that might lead me to assume a consciousness in them if there is admitted to be a consciousness in me, or a purpose objectively defined in them if there is admitted to be such a purpose in me? The series of events leading to my actions and the series of events leading to other organic phenomena evince in common, it has been said, an adaptation to the future.[6] The environment follows its line of development and the series of organic phenomena develops on its part to a point at which the organism is in harmony with the environment. But the organism is adapted to the object in its environment before that object is there. In other words, the series of organic changes reaches its conclusion before the organism is in contact with its object, that is to say, before the environment has reached a corresponding point in its development. Now this characteristic that my actions and other organic phenomena have in common may be a good basis for analogical reasoning. But this fact that one series reaches its conclusion before the other can not relieve us from the necessity of finding a connecting link between the two series to account for the final harmony between organism and environment. Besides evincing an adaptation to the future, organic phenomena have been said to have other characteristics in common. Organic phenomena, it has been said, are not subject to certain physical laws, such as the second law of thermodynamics. And it has been said, notably by Driesch, that organic phenomena are not causally determined, one by the other. Now these facts, and other facts that have been adduced, are all proper bases, if true, for an argument from analogy. But, let me repeat, the thesis that organic phenomena are not causally determined can not lead us directly to the belief that there is a purpose in this series of phenomena. It implies that there is no determining factor to account for organic development and can not lead us to seek such a determining factor in a purposive entity.

The characteristics my actions and other organic phenomena

[6] Janet, *Final Causes*, translation by Affleck, p. xviii; Warren, *A Study of Purpose*, this JOURNAL, Vol. 13, p. 33.

have in common are no doubt sufficiently distinct to make possible a definition of purpose in terms of them. They are also sufficiently widespread and numerous to lend much force to an argument from analogy. Nevertheless they do not force upon us an absolute conviction that whatever we find in the case of my own actions exists in the case of other organic phenomena. They force upon us only a certain presumption that things alike in so many respects are probably also alike in others. Furthermore, the qualities that are carried over by analogy and presumed to exist in other organic phenomena can only be qualities that are admitted to exist in the case of my own actions. Within these limits the general form of the argument for teleology is simple and unassailable. However, to arrive at the conclusion that the purpose that is in or associated with the series of events leading to adaptive organic activity is of one sort rather than another, further argumentation is necessary. If this purpose is held to be an unconscious purpose, it must be shown that an unconscious purpose is not a contradiction in terms. If this purpose is held to be associated, not with the organic phenomena that immediately precede the adaptive response, but with a First Cause that initiates the whole series of organic phenomena, then it must be shown that this First Cause exists. If, finally, it is held that this purpose is not a quality of the organic phenomena we investigate, but is a non-temporal entity associated with these phenomena, then it must be shown that it is not impossible for a non-temporal entity to be related to a temporal one. These, however, are special questions that are not relevant to the general argument for a teleology of some sort. The simple thesis that there is a purpose in organic and perhaps in inorganic phenomena relies merely upon a description of the qualities the entities held to be purposive have in common and upon the assertion that purpose is a thing that is given in these qualities or that is to be inferred from them. It is a thesis that neither necessarily denies the existence of efficient causes nor offers a substitute for them.

When scientific men realize how limited in scope the argument for teleology is, they feel in many cases that the concept of purpose is harmless. They "accept purposive events as a specific class of natural processes"[7] and make no further ado about them. Their attitude is that of a host who greets his guest, but then ignores him. Are final causes, however, to be ignored after they have been admitted? It was Leibniz, scientist as well as philosopher, who was particularly concerned that they should not be. "Final causes," he says, "are of service in physics, not only to make us admire the wisdom of God, which is the principal reason, but also for knowing

[7] Warren, *A Study of Purpose.* This JOURNAL, Vol. 13, p. 6.

things and for managing them."[8] Now there are several ways in which final causes may assist us in knowing things. If we assume that there is in a series of phenomenal events a purpose, nay a supremely intelligent purpose, we may then arrive at an hypothesis as to the manner in which this series of events is developing. It was in this manner that Leibniz arrived at an hypothesis as to the manner in which rays of light are conducted from one point to another. Such hypotheses must of course be tested by experiment before they are acknowledged to be satisfactory, yet the initiation of hypothesis is no mean element in the growth of knowledge. Indeed many of the scientific theories we now accept were, we must recognize, first suggested by teleogical considerations. Again we may be said to be making use of final causes when we conclude from the occurrence of what are held to be purposive events that there is an environment to which these events are adapted. We may find the fossil remains of a dinosaur and conclude therefrom that there was an environment to which such a purposive organism was adapted. We may assume in the human body a desire to combat destructive bacteria and look in consequence for the manner in which such a purpose might be achieved. Such arguments that may be based upon the assumption that purpose exists are not at all unusual. And so we find that though the scientist may be rather shy of the concept of teleology, arguments that may be called teleological are neither useless nor unfamiliar in his domain. Final causes, if they exist, are no substitutes for efficient causes. Yet if they exist, the concept of purpose has a place in science as well as in philosophy.

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METHODOLOGICAL TELEOLOGY

IT may still be disputed whether the philosophic discovery of the Pragmatic Method has provided the world with a perennial source of new truths, but it is surely beyond dispute that it has stimulated its critics to an unceasing flow of new errors. The last of these which have seemed to me worthy of correction are contained in Professor Warbeke's article on "A Medieval Aspect of Pragmatism."[1]

After echoing a number of old misconceptions about Pragmatism as *χαμαιλέοντα καὶ σαθρῶς ἱδρυμένον* Professor Warbeke proceeds to show that he has not yet succeeded in grasping that Pragmatism is primarily a method, not a dogma; a theory of knowledge, not a

[8] Leibniz, Reply to Reflections found in the *Journal des Savants*. Duncan, *The Phil. Works of Leibniz*, 2d edition. p. 116.

[1] This JOURNAL, XVI., p. 207.

metaphysic. On the strength of this misapprehension he proceeds to argue that Pragmatism must assume there is inherent in reality a teleological constitution which guarantees satisfaction to human desires, and that this assumption is a medieval anachronism which accords ill with the pluralism and empiricism professed by pragmatists. "It is the logical implication of a doctrine which asserts the *ethical*[2] good of man (whether individually or collectively) to be the criterion (howsoever determined) of whether things exist or do not exist (Reality), and what their several relationships are as we apprehend them (Truth)," (p. 214) . . . and "it involves a teleological point of view for all truly known reality" (p. 215). In the course of this argument he states what he believes to be the assumptions made by pragmatism in its proof that its "theory in human *good*[2] is the index of all true insight" (p. 211), and among them that "all things *are*[2] so coordinated with the valuable interests of men that correct knowledge of any existence or event contributes to those interests; and negatively, that a representation of things which does not so contribute is contrary to fact" (p. 211). Pragmatism has also to burden itself, according to Professor Warbeke, with "existences, real things, and relationships among them," definite relationships between mental states and their objects, causal relationships, "definite qualitative characters in our mental life," *etc.* All these are to be regarded as no less "axiomatic" in pragmatism than "in any positive theory of knowledge."

Now a little reflection will show that this whole contention itself proceeds upon certain presuppositions which are, quite explicitly, repudiated by Pragmatism. It presupposes an unpragmatic logic and an unpragmatic metaphysic. Professor Warbeke's logic is still one which worships the Euclidean proof, and tries to start from axiomatic presuppositions in order to attain absolutely true conclusions. But to a pragmatic logic 'axioms' are always essentially postulates, and conclusions are only proved hypothetically, and always stand in need of empirical verification, a fact, of course, which debars them from attaining absolute truth. Professor Warbeke's metaphysic is still of the naive variety which imagines that absolute knowledge of reality can be taken for granted, and that all critical inquiry as to whether what is taken as real is truly so taken, can be ruled out of order. Naturally enough, therefore, he can not understand such conceptions as the 'making of truth' or of reality,[3] nor grasp the essential connection between the enunciation of a 'truth' and the action which follows upon and tests it.

[2] Italics mine.

[3] It is pretty clear that he does not refer to them because he does not see their relevance. In general, his references to me are inaccurate and somewhat

To one who understands pragmatism, however, all Professor Warbeke's presuppositions and contentions will seem a brood of misconceptions hatched out of a mare's nest. Such a one would not gaily start from an assumption that the reals which he may find it convenient to recognize in beginning a cognitive inquiry must be absolute and ultimate, but would regard them as provisional and relative to the state of his knowledge. Consequently he would be ready to modify or drop them as the inquiry progressed, and to substitute better alternatives. And as he would not have committed himself to begin with to the gratuitous assumption of intellectualism that the theoretic formulation of a problem and the action to be taken in consequence had nothing to do with each other, he would not imagine that whatever had to be recognized as real at the outset of his inquiry must of necessity remain so forever, and could not be reduced to unreality. Hence he would at most formulate his teleological postulate that 'things *may be* (not "are") so coordinated with interests of men that the truth about them may be valuable,' and this formulation might serve as a further illustration of the contention that all real judgments in ultimate analysis contain a reference to practise.

Now by this substitution of 'may be' for 'are' in the teleological postulate the pragmatist evidently reduces it from a metaphysical dogma to a methodological assumption. It no longer presupposes anything about the universe, not even that there is one, *i. e.*, that we can handle what we believe to be the real by applying this notion to it. It does not mean that he knows in advance of experience that the universe is going to be good, to grant him what he desires; it only means that he means to try to make the best of it—like the analogous assumption that reality is plastic.[4] And to give himself, and it, a chance, he means to act *as if* he could get what he wants. How else could he proceed? How else could he be encouraged to experiment and persevere? What more modest postulate could he make? The methodological optimism of his heuristic teleology does not repel any answer the real may give, short of utter pessimism; and an unmitigated series of cognitive failures might compel even to that.

superficial. Thus he attributes *to me* (p. 208) a demand for the 'abrogation' of the law of contradiction which actually occurs in an exposition of Hegel! And I have surely protested often and elaborately enough against the simple identification of the 'true' and the 'useful' (*e. g., Mind,* Nos. 84, 88) not to deserve to have a condensation like " 'true' simply *means* 'useful' " foisted upon me (p. 210). On the other hand the proposition that *the useless is false,* which Professor Warbeke declares to be only *implied* in the passage he presumably refers to (*Humanism,* p. 38), is actually in the text, and is explicitly shown to follow formally from *all truth is useful.*

[4] *Cf. Personal Idealism,* p. 61.

It is evident therefore that nothing metaphysical is implied in the pragmatist's interpretation of either action upon, or judgment about, reality. The "teleological constitution" involved in them is only a methodological assumption, and is, moreover, inevitable on *any* view of the world. For methodological teleology only formulates a little more definitely an indispensable postulate of the knowableness of the world, begging no question and presupposing no answer. For the mind to know the world it has to be supposed that the two are to some extent and in some sense commensurable. If there is *no* commensurability between the nature of the real and human faculty, the enterprise of knowing is clearly vain and doomed to failure. Skepticism is the only theoretic, and pessimism the only practical, outcome of philosophy. We must therefore *hope* for commensurability, and assume it in all our methods of investigation. In point of fact we always do, and the difference between teleological and causal explanation is not one of principle. *Both* are *ex analogia hominis,* and postulate a sort of commensurability. If then there is *any* commensurability, however slight, knowledge is possible and attainable in varying degrees. And if postulation is in use and in order in any case, why should we stint ourselves? We naturally hope for the utmost; if our claim to that can be made good, the world will be rendered more knowable and congenial than it would otherwise be. And as it is a question of postulates there is no sense in diffidence. We may as well try for a maximum as for a minimum. If it is a fact that the mind works teleologically—and no one ventures to deny this outright—it follows that we shall find the world most knowable if it is assumed to work similarly, or at least in such a way as to be adequately representable and controllable by our teleological procedure. In our dealings with nature, even if we suppose its reactions to be all determined in advance by its mechanical character, it costs no more to ask for much than for little; we may as well therefore ask for as much as we want, lest by trying for too little we fall short of getting all we might otherwise attain.

In this whole procedure, however, there is nothing peculiar to humanism. It differs from the other philosophies only in being more fully conscious of the advantages, and franker about the risks, of their common method. It is not deceived into taking a methodological assumption for an *a priori* truth. It is not deluded into expecting nature to be in duty bound to submit to every 'necessity of thought,' but knows that it may have to fight hard and long to make good its postulates. It is not restricted to the contemplations of pure thought, but feels free to experiment and act and change the real. Why then should it scruple to make a postulate which is

universal and legitimate? To refuse would merely paralyze both thought and action without benefit to either. To assent is nothing more than to express willingness to investigate a vital problem.

It is a further mistake of Professor Warbeke's to ascribe a metaphysical intention to the doctrine of the connection between the Real, the True and the Good, and of the supremacy of the Good. For that too is not a dogma. In the "Ethical Basis of Metaphysics" the meaning intended, and, I should have thought, expressed with unmistakable clearness, was epistemological, and concerned with the 'priority of the *epistemological* question over the *ontological*.'[5] This argument rests upon a very obvious observation, and refers to a very simple situation. The observation is that 'truths' are *values*, real or supposed; the situation is that every claim to know logically implies that the truth-claim enunciated is *better* than any alternative that could have been alleged. In raising therefore a question of 'fact' or of 'knowledge,' we are inevitably raising a question of 'value,' which conditions the other two.[6] The only point about which there can be any difficulty is in perceiving that this is a logical implication, even when it is not a psychological fact. Whenever several alternatives have been considered before the judgment was enunciated, this claim to superior value is obviously a plain psychical fact; but when no alternatives were entertained and present to the mind, the value remains implicit. It may however at once be brought to the surface by challenging the judgment and alleging a better. Its maker must then either establish its superiority or withdraw it. Hence a claim to superior value must be conceived as logically implicit in it from the first. And so the doctrine of the control of cognition by the notion of Good is an easy corollary from the psychological law that every (real) judgment is always the *best* its maker could conceive when he made it.[7]

'Good,' however, is to be taken in its wider or teleological sense, not in the narrower sense in which it is specifically opposed to 'evil,' in *modern* ethics. To have failed to see this is a third error of Professor Warbeke's, and perhaps the least excusable. For not only had it been carefully explained, with a reference to Plato, that the Good meant "the conception of a final systematization of our purposes,"[8] but the double antithesis of 'good' in English to 'bad'

[5] *Humanism*, p. 9.

[6] *Humanism*, p. 10.

[7] This law has only been obscured by the fondness of philosophers, and especially of logicians, for 'paper' judgments, which are only verbal forms, and convey no actual meaning.

[8] *Humanism*, p. 11. *Cf.* similar definitions in *Studies in Humanism*, pp. 6, 152, 154, 191, and *Formal Logic*, p. 2.

and to 'evil,' might surely have been a sufficient warning against confusing these two senses of 'good.' Nevertheless Professor Warbeke writes throughout as if 'good' could mean nothing but "the physical wellbeing of humans," and girds at the inconsistency of pragmatists in recognizing a variety of human goods and their inability (or unwillingness ?) to set up "a typical *homo* whose good might serve as a basis for reference."[9]

This error I may perhaps have facilitated by recognizing as ethical also the antithesis of *good-and-bad,* in order to accommodate the Greeks, to whom that of *good-and-evil* was foreign; so it may be my duty to correct it. Now of course the teleological valuation *good-or-bad* refers primarily to the valuations of *any one* who entertains a purpose, and is relative to him. In other words, any one has a right to call 'good' whatever suits him, and 'bad' what doesn't, and every one freely exercises this right. Both are so far personal value-judgments, or *value-claims.* There is no reason whatever, therefore, to expect them to coincide or to be other than plural, multifarious, 'subjective,' incompatible, and variable. The question of standardizing these individual judgments, and rendering them 'objective' and 'universally valid,' comes later. It is a question of the *ideal,* and of getting all to accept the same ideal. It is not a question that concerns the scientific description of human nature. For to science, as to common sense, it is abundantly clear that as yet there is *no* agreement or concordance about the ends men seek and the good they covet—unless we cynically say that all covet other goods than their own. Any one who in the year of grace 1919 can babble about such a concord must have been dreaming for the past five years in Utopia or Cloudcuckoodom. If the human pursuit of ends is to be unified and to end in universal harmony, that end can not be 'presupposed'; it has still to be achieved. What the ultimate ideal is to be will have to be fought out, and may well take seven wars worse than the last, or even seventy times seven. As for "the typical *homo*" whose good is to be the measure of all things and who is to lay down the law for all, it is evident that he would be a superman of the most tyrannic sort. Actual human nature would most certainly rebel so soon as it was attempted to control it by any such conception. But why should it be necessary to anticipate these future troubles in order to recognize that every one naturally judges his experiences by reference to his own ends and standards of value? Truly when pragmatism is hauled over the coals for recognizing so plain a fact one can not but agree with Dr. Rashdall that "in philosophical criticism one man may steal a horse while the other may not look over the fence"!

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[9] Pp. 208, 210. *Cf.* also the quotations italicized above.

REVIEWS AND ABSTRACTS OF LITERATURE

Forced Movements, Tropisms, and Animal Conduct. By JACQUES LOEB. Philadelphia and London: J. B. Lippincott Company. 1918. Pp. 209.

This is the first volume of a series of monographs on experimental biology, of which eleven others, by experts in various subdivisions of the field, are in preparation; and presents the "tropism theory" in its most recent developments. The chapters which contain most new material deal with reactions to light. The bibliography of the tropism now comprises about five hundred and sixty titles.

The general outline of the theory is familiar to most readers of this JOURNAL. It holds that the reactions of both plants and animals to stimulation are determined by the comparative intensity with which the stimulus acts upon symmetrical points of the organism. An animal or plant which moves towards a certain stimulus does so because the muscles on the more stimulated side contract more strongly, thus turning the organism head on to the stimulus; an animal or plant that moves away from a stimulus does so because the muscles on the less stimulated side contract more strongly, thus turning the organism "tail on" to the stimulus. The cause of these physiological effects through the stimulation of symmetrical points is of course still a matter of hypothesis, but is supposed to be purely physico-chemical.

In his investigations and his published discussions, it is unnecessary to say, Professor Loeb shows the qualities and defects of one who has thoroughly made up his mind. It is not for the present reviewer to criticize his experimental investigations, creative and pioneer researches in a difficult field. But he writes always with his opponents in mind, and it sometimes seems as though, like most fighters, he grouped them rather indiscriminately and regarded neutrals as enemies. He naturally, of course, opposes vitalists, believers in free-will, and authorities who like Jennings, though neither vitalists nor libertarians, do not regard oriented reactions as the fundamental type of behavior in living organisms.

Since the limits of a review forbid a full discussion of the tropism theory in its relation to these other positions, the reviewer will present merely certain detached thoughts which have been aroused by reading "Forced Movements."

First, an old adversary of Professor Loeb's, attached, if I remember rightly, in his earliest articles thirty or more years ago, if the person who says that an animal goes towards a stimulus because it gets pleasure from the stimulus. Now as a matter of fact this person may be a determinist and a mechanist; he may welcome

demonstration that the animal in question is forced by the physico-chemical effect of the stimulus on symmetrical points to go towards it, and still he may believe that pleasure, as an epiphenomenon, is present in the animal's consciousness, and may use the introspective term because it is convenient. Should Professor Loeb condemn him? In Chapter XIX. of the present book the more complicated behavior of men is explained as due to the orienting influence not of present stimuli, but of memory images. I submit that "memory image" is an introspective term. "Conditioned reflex," indeed, is not; but hypotheses as to the functioning of the brain are not yet adequate to explain memory images fully in terms of conditioned reflexes.

Secondly, Professor Loeb has for many years maintained that the heliotropism of plants is identical with that of animals. The demonstration that the blue rays are most effective for plants and the yellow-green rays for animals he now meets with evidence to indicate that for some plants the yellow-green rays are more effective and for some animals the blue rays are more effective. But why is it important to him that plants and animals shall react to different wave-lengths in the same way? It would not contradict the tropism theory if their physico-chemical processes were sufficiently unlike to be excited in different degrees by the same wave-length. In urging so strongly the identity of plant and animal heliotropisms, Professor Loeb seems to have had in mind the person who, admitting that plants are unconscious, would be forced by this identity to consider animals also unconscious in their light responses. Now clearly, if this conclusion were reached, it would be on the basis of an insecure analogy. And it is interesting, as an illustration of the effect of a controversial attitude, to find Professor Loeb condemning an analogy of this type, used by Hess, who argues that because to certain animals the distribution of effectiveness of different wave-lengths is like that of color-blind human beings, therefore these animals are color-blind. Professor Loeb points out, as indeed the present reviewer had done (*The Animal Mind*, second edition, page 157), that the conclusion does not follow, since the physico-chemical processes may be different even though the distribution of spectral effectiveness is the same: a type of argument which would have relieved him from the need of maintaining so long the identity of heliotropism in animals and plants.

There is doubt in the reviewer's mind, finally, as to how much the tropism theory as such contributes to the understanding of human behavior. Anything that either furthers or opposes a physico-chemical explanation of such behavior is obviously a great contribution. But the principle of *forced orientation*, which is the essential point of the tropistic hypothesis, seems to be so complicated and over-

laid by conditioned reflexes and "memory images," whatever the latter may be as physico-chemical phenomena, that it at no period in the human individual's life really comes into play. The infant's behavior, so far as orientation to symmetrically acting stimuli is concerned, appears to be full of inaccuracies that have to be gradually eliminated. Phylogenetically it may have developed from the behavior of lower organisms with clear and unmistakable tropisms, but one has to deduce the probability of this from one's previously existing belief in good old-fashioned mechanistic determinism: one finds no new support for such determinism from the tropism theory as applied to human conduct.

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Outline of Social Philosophy. J. S. MACKENSIE. New York: The Macmillan Co.

This book is an expansion of a short course of lectures delivered at the London School of Economics and Political Science. It seems to the reviewer to be a credit both to the school and the author. Nothing is quite so important in the discussions of social and political life as knowing what after all one is talking about, *i. e.*, what is the meaning of the words one is compelled to use. The words in these matters stand for concepts that are anything but clear, concepts that by their very nature are confused and confusing and not only to the lay mind. To make this evident to the student, to teach him to ask himself even in his private thinking, what he means precisely by his terms is to render a great service. A mastery of the contents of this little treatise would be of great value alike to student and teacher.

From the very nature of the task undertaken it is a philosophy, "an effort to view particular truths and facts in relation to a whole within which they are included." And as a *social* philosophy it "seeks to interpret the significance of human life with reference to that unity."

The author acknowledges his obligation in particular to Thomas Hill Green, and Bernard Bosanquet, and so of necessity to Hegel. But as they have modified Hegel, he in turn has modified their teaching. The error in the Hegelian, which is charged by some with the iniquity of the world war, seems to have been corrected by the author, while preserving that fundamental in human life which was misinterpreted by Hegel and not altogether rightly understood by his Oxford disciples. In the fierce light of the Great War some things are more manifest than they were before. The empirical practical-mindedness of England tends to correct the absolute of

German thought. In both community is the basis. In the one growing up from within by natural process in practical experiments; in the other from without put down upon according to an external idea. In the one the idea is an hypothesis for experiment and modification according to results. In the other correct logical inference from the idea, rather than practical consequence dominates. Mackensie's book, in spite of his remote intellectual forbears, is English-minded.

The author starts with a consideration of human nature as by its inborn constitution pushing toward community life. In this vast movement of humanity appear the various modes of association, the social institutions that arise in the national order, family, school or education, industry, state, justice. This is followed by discussion of institutions that transcend national boundaries and tend toward the inevitable goal of a world order. They are international morality, law, trade, and of a different character, religion and culture. The essential nature of each of these institutions and their interrelation in the unity or community is exhibited. Gilbert Chesterton's saying: "the important thing about a man is his philosophy" is nowhere more true than in the realm of social philosophy. To have such a philosophy is corrective of the pettiness of the private man, of the narrow-mindedness of specialist in science, and of the partisan and patriot in government. It is the absence of such a comprehensive view which a social philosophy would give them, that makes certain senators partisan politicians instead of statesmen of national and international wisdom and reputation. Such men are anarchs in high places resisting community through dimness of eye and narrowness of sympathy, putting personal, party, and national advantage before human welfare, and inviting chaos instead of organizing it. Whether a man has in such a case a social philosophy, and of what sort it is, is the important thing about him.

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JOURNALS AND NEW BOOKS

REVUE DE MÉTAPHYSIQUE ET DE MORALE. September-December, 1918. *La réforme de Luther et les problèmes de la culture présente* (pp. 533–573): C. A. BERNOUILLI.–"The eccelesiastic schism of Luther and his followers has been at bottom a strife for the unity of the spiritual existence of Europe. . . . Thus in spite of appearances, it is an analogous crisis that Europe is undergoing at present." *Pourquoi Luther n'a-t-il créé qu'un christianisme allémand?* (pp. 575–612): IMBART DE LA TOUR.–"Did the German

spirit create Luther or Luther the German spirit? . . . Never were religion and country more closely welded." *Le sens de la Révolution religieuse et morale accomplie par Luther* (pp. 613–645): E. EHRHARDT. – Luther engaged in his work of reform without preconceived plan and without even intending to be a reformer. He was led only by his personal experiences of a specifically religious order. *Réforme et préréforme. Jacques Lefèvre d'Etaples* (pp. 647–667): N. WEISS. – An account of a French reformer prior to Luther and of influence on the career of Calvin. *La prédestination d'après Calvin* (pp. 669–705): H. BOIS. – Predestination is not exclusively Calvinistic, but a dogma common to all the reformation. However, protestant thought "is obliged to traverse the Christianity of Calvin to better grasp in its purity the simplicity and profundity of the Christianity of Jesus Christ." *Note additionnelle sur la Réforme française. Les Apôtres de la tolérance* (pp. 707–718): F. BUISSON. – A study of religious ideas before Calvin, against him in his day, and after him that triumphed with the revolution of 1789. *Le protestantisme en Angleterre* (pp. 719–741): F. W. WATSON. – An attempt to define the meaning in which the term protestant Church of England is used by the English through an historical study. *La marche du courant calvinisme en Grande Brétagne* (pp. 743–767): P. FARGUES. – The fundamental principle, that of free examination, has been enlarged little by little and adapted itself to the demands of science and of social life. *Les Anabaptistes* (pp. 769–805): F. PALMER. – The Anabaptists, as a by-product of Protestantism, are significant as introducing the idea of democracy. *Calvin et l'Entente. De Wilson à Calvin* (pp. 807–840): F. DOUMERGUE. – A presentation of documentary evidence that Calvin is the founder of modern liberty. *Les deux Réformes: le Luthéranisme en Allemagne. Le calvinisme dans les pays de langue anglaise* (pp. 841–891): J. CHEVALIER. – An attempt to show the difference in these reforms which make the one culminate in Prussianism and the other in ideas suitable to English-speaking peoples. *Les aspects religieux de la guerre* (pp. 893–921): E. VERMEIL. – The Anglo-Saxons and the French require more intimate organization, and the organizing power of religion should be an object of reflection to both Protestants and Catholics among the allies. *L'esprit conservateur et l'esprit révolutionnaire dans le luthéranisme* (pp. 923–956): CH. ANDLER. – Luther represented a revolution in faith and in the Church combined with a political conservatism.

Jones, D. Ambrose. Philosophic Thought and Religion. New York: Macmillan Co. 1919. Pp. 60. $0.80.

Solovyof, Vladimir. The Justification of the Good: an essay on moral philosophy. Translated by Nathalie A. Duddington. New York: Macmillan Co. 1918. Pp. lxiii + 475. $4.50.

NOTES AND NEWS

Mind for July contains an interesting appreciation of the late John Cook Wilson, Wykeham Professor of Logic in Oxford since 1889, written by H. A. Pritchard. Professor Wilson was born in 1849, and entered Balliol in 1868. From that time until his death in August, 1915, he was connected in one capacity or another with Oxford University, being Fellow of Oriel College from 1873 until 1901 and Fellow of New College from the latter date until his death. His published writings consist of a few books and pamphlets and numerous contributions to scientific periodicals, most of them dealing with mathematical subjects or with problems in connection with the text and interpretation of the works of Plato and Aristotle.

We quote the following paragraphs from Mr. Pritchard's article:

"The point of departure of Cook Wilson's views lay in his unwavering conviction of the truth of mathematics. In mathematics we have, without real possibility of question, an instance of knowledge; we are certain, we *know*. Those who talk of non-Euclidean spaces are using mere words to which no thought corresponds. It is impossible to conceive hyperbolic or elliptic space. The fundamental objection which confronts those who suppose themselves able to conceive such spaces lies in the fact that the corresponding figures contradict our faculty of construction; we can not, for instance, imagine straight the so-called straight lines of which they speak, and to suppose, as they do, that this does not matter is erroneous and due to an illusion about the function of imagination in geometry. They can be refuted on their own ground, since it can be shown that they use only the conception of *Euclidean* space in the hypothetical reasoning in which their theories about such spaces consist, and it is a mere mistake to suppose that a train of hypothetical argument will never lead to a contradiction of a certain kind, because up to a given point it has not done so.

"In consequence the skepticism inherent in the philosophy of those who follow the metageometricians was wholly alien to him. The coherence theory of truth, again, was according to him not only impotent to lead to any positive result but was vitiated from the start by the existence of mathematics, where we presuppose that no future experience and no further advance either in mathematics

itself or in other departments of knowledge can contradict the knowledge we already have. (He was fond of insisting that in that reasoning which is knowing we presuppose that the knowledge which constitutes the premises can not be modified, in the sense of contradicted, by any future experience.) Equally alien to him was the position represented in Mr. Bradley's *Appearance and Reality*. Neither knowledge nor reality admitted of degrees. Reflection on our experience may and does give rise to puzzles in plenty, but the result is not to show that our fundamental notions about the world are inherently self-contradictory; where such contradictions are alleged, the cause lies in some fallacy, usually simple, in which we have been unconsciously involved. On the contrary, space, time, bodies, minds (and when we reflect we see that we really do know what we mean by these terms) are real and in no sense 'appearance.' In fact, his outlook might be described as essentially 'objective.' No student who followed and accepted the workings of his mind would expect the study of philosophy to transform his unreflective view of the world into something unrecognizably different. It was the business of philosophy to study the presuppositions of the sciences, but the man of science had no need to fear that, as a result, the sciences would be shown to be illusion or even to require revision in detail. Philosophy could add to the knowledge which was science by contributing the solution of its own problems, but it could not destroy or interfere with scientific knowledge."

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